

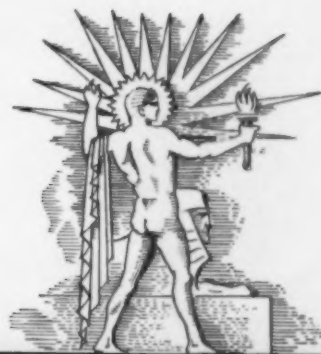
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



MAY 23, 1931

Ho-Hum! Even the Cat Gets It

See Page 335

A

SCIENCE SERVICE PUBLICATION

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Summary ofCurrent
Science

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The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

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DO YOU KNOW THAT

It has been suggested that leather flooring would help use up America's surplus of 100,000 hides.

A method of classifying stars according to brightness was worked out by Hipparchus in the second century B. C., and is still in use.

In order to accustom themselves to the weight of chain mail, young esquires of the middle ages would take vigorous exercises and turn somersaults while wearing complete armor with the exception of the helmet.

Female tarantulas have been known to live 13 years.

Bloodroot juice was sometimes used by Indians when they painted their faces for war dances or fighting.

Five whooping cranes, a species nearly extinct, are reported to have wintered on the coastal prairies of Texas.

A library of more than 3,000 manuscripts has been unearthed by Dr. Sven Hedin's expedition in ruins in the Gobi Desert.

A recently developed boring machine drills holes for drainage pipes beneath highways without interrupting traffic.

The state of Idaho has set aside 1,000,000 acres of its wildest mountain territory as an area never to be "civilized" but left untouched for vacation travelers.

A method of collecting chlorophyll, the green pigment in plants, in quantities large enough for convenient study has been perfected by a scientist in the U. S. Bureau of Chemistry and Soils.

To determine the solidity of cabbage heads, an ingenious research worker measures the displacement of water by each head of cabbage, the volume and density being thus determined.

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Science Service presents over the radio, an address

THE DISTANCES OF OUR NEAREST STARS

By Dr. John A. Miller, director of Sproul Observatory, Swarthmore College

Friday, May 29, at 2:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

METALLURGY

New Process Economically Recovers Zinc From Ores

Development of U. S. Bureau of Mines Is First Notable Change Since Chinese Smelted Metal in 600 A. D.

A SIMPLER, cheaper method of smelting zinc from the concentrated ore in purer form than it has been recovered in the past by smelting methods has been devised by Charles G. Maier, metallurgist at the Pacific Experiment Station of the U. S. Bureau of Mines in Berkeley, Calif. The new method is said to be the most important change in the smelting of zinc since the metal was first smelted by the Chinese in 600 A. D.

Described Before Engineers

Mr. Maier's process was described before executives and engineers of the zinc industry at the meeting of the American Zinc Institute by R. S. Dean, chief engineer of the metallurgical division of the Bureau of Mines. While it is not expected that the process will immediately revolutionize the industry, it will doubtless be adopted by many plants as rapidly as old equipment can be economically discarded.

The development is welcomed as a partial solution at least to the problems of concerns that solely mine and smelt zinc. The present low price of zinc, it is said, is caused by the dumping of zinc on the market by mines of which zinc is only a by-product. If zinc miners can produce a purer product cheaper than they are doing now, their troubles will be considerably lessened. Officials of the Bureau of Mines say that it is impossible to state quantitatively what savings the new method will effect.

By present processes zinc oxide concentrated by mechanical means from the ore is heated in clay retorts with coke until the coke unites with the oxygen of the oxide to form carbon monoxide and carbon dioxide, leaving metallic zinc. The coke has to be shipped to the zinc mines from great distances.

The new method employs natural gas, which is abundant near many zinc mines. Natural gas, known to chemists as methane and composed of one carbon atom to four of hydrogen, is passed over the zinc concentrate at a lower temperature than that used in the old retorts.

All the products of the resulting reaction are gases: the zinc vaporizes and condenses in almost as pure form as that now obtained electrolytically; the oxygen of the oxide joins the carbon to form carbon monoxide, while the hydrogen passes off as the free gas.

An abundance of these by-product gases is generated and used to pretreat the concentrate and heat the retorts. The temperature of the chief reaction is so low that a metal instead of a clay retort can be used. Additional economy is also achieved by the fact that the process is continuous whereas the old method is intermittent.

From Theory to Practice

The working out of the new method is a striking illustration of the application of fundamental research to engineering problems. For some time engineers had been seeking with cut-and-try methods a new process of smelting zinc, but had had no success. Mr. Maier, a physical chemist, studied the reactions involved in converting zinc ore into the pure metal and became convinced that those looking for a new

process were not working in the right direction.

He then worked out theoretically the chemical equations for what he thought would be the right process. These reactions were next checked in the laboratory and found to take place as predicted. The final step was the building, during the past year, of an experimental plant at the Rare and Precious Metals Experimental Station of the Bureau of Mines at Reno, Nevada, where the process was actually tried out.

Science News Letter, May 23, 1931

AVIATION

Improvements to Autogyro Make Craft More Useful

GREATLY improved over predecessor models of just three years ago, the 1931 autogyro can more nearly duplicate the performance of ordinary airplanes and at the same time maintain its ability to take off at an extremely sharp angle and descend almost vertically and slower than a falling parachute.

Perhaps the greatest improvement that has been made in this country since H. F. Pitcairn brought the first autogyro to America in 1928 is the speeding up of the rotors by a clutch connection with the motor. The present models are able to travel 125 miles per hour in contrast with the 70-mile-per-hour speed of three years ago.

Cabin autogyros are being developed in England, while France is experimenting with seaplanes of the new type.

Science News Letter, May 23, 1931



Wide World

DEMONSTRATING IMPROVEMENTS ON THE WHITE HOUSE LAWN

An autogyro plane taking off easily from the tree-confined grounds behind the White House after its pilot had received the Collier Trophy for the outstanding development in aviation during 1930.

ENTOMOLOGY

Yearly Food Bill of Insects Could Build Whole New Fleet

MORE THAN nine hundred million dollars—enough to replace every battleship in the U. S. Navy with a brand new \$40,000,000 dreadnought and have quite a lot left over for cruisers—is the annual food bill of the major insect pests of the United States.

This staggering sum has been totaled by J. A. Hyslop of the Bureau of Entomology, U. S. Department of Agriculture, out of estimates of damage done by 34 of the more important of the many-legged enemies of man's crops, forests and manufactured products. This estimate covers only a small number of species, though it does include the most harmful ones. But there are now about 6,000 species of insects on record as of economic importance, though many of them do little damage.

The biggest single item in the damage done by insects is charged up to the cotton boll weevil. Its dinner check comes to \$164,500,000, nearly enough in one year to pay for all the "treaty cruisers" that Uncle Sam expects to build. The cotton boll worm is another terrific offender, scoring second with a damage of \$104,000,000 per year. This is not all wreaked on cotton, however, for under the alias of corn ear worm the same insect raids our most important cereal crop, and it also throws tobacco and tomatoes for a loss.

None of the other insect species does damage running up to nine figures, though there are eighteen of them that get into the eight-figure class, ranging from the spruce budworm at \$71,400,000 down to the clothes moth, whose larvae defy all the ill smells that man can marshall against them, to the tune of \$10,800,000.

Our vanishing forests, yearly scored by devastating fires, have the invisible fires of hungry insect appetites constantly raging against them. Including the damage done by spruce budworms, insects attacking forest products, bark-beetles and miscellaneous leaf-eating pests, the total losses to forests and forest products amount yearly to \$138,300,000. This figure, however, does not include termite damage which is wrought principally on standing buildings or piled lumber. The termites, or "white

ants," account for \$29,290,000 worth of ruin every year.

What insects do to corn, wheat, oats and other grains in storage is estimated only in the most general way. A round figure of \$50,000,000 a year is given. The same figure is set for the losses due to grasshoppers, locusts, crickets and their kin, making a total of a hundred-million-dollar tax on the national bakers' bill collected by the principal enemies of grain.

Science News Letter, May 23, 1931

BOTANY

Redwood Heart-Rot Caused by New Fungus

REDWOOD lumber can be largely saved from the destructive fungus that causes brown heart-rot by the simple expedient of rolling the sections of

a trunk apart after it has been sawed into short logs. This fungus gets its start in dim, damp cracks like those left by a crosscut saw, Prof. Emanuel Fritz of the University of California has discovered.

Although the disease has been known for a long time, and has been traced to a fungus, the causal organism could not be identified because its fruiting bodies had never been found. Prof. Fritz discovered these in saw kerfs between logs, in rift cracks in lumber, and in the hollow butts of trees.

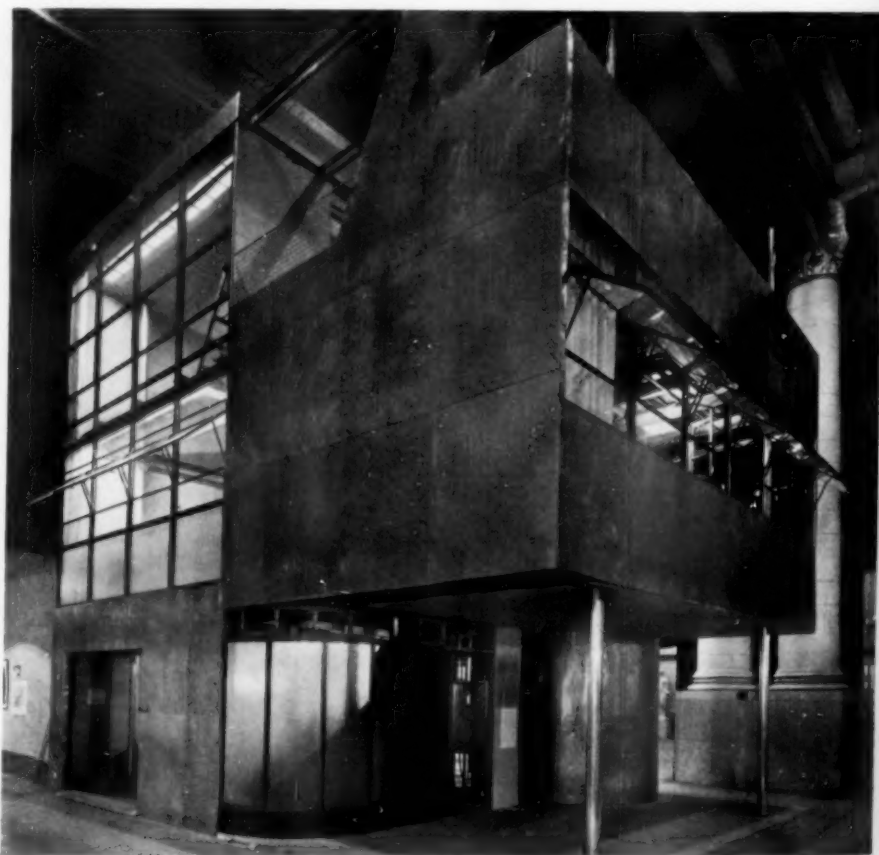
Science News Letter, May 23, 1931

ARCHITECTURE

Architects Examine Thoroughly Modern Home

A TYPE of home that makes full use of the latest modern inventions is pictured below as it was shown at the biennial Architectural and Allied Arts Exposition in New York. (SNL Apr. 25, '31). Its walls are open in places to reveal the interior construction.

In spite of its bare, metallistic appearance, the house is designed to be convenient, comfortable and healthful. The construction is mainly of glass, alumi-



A FUTURE HOME LAID BARE BEFORE ARCHITECTS

num and steel, insulated so that a three-inch wall is more effective than 14 inches of masonry in excluding heat and cold. Instead of the usual supporting walls of brick there are six slender columns of aluminum upholding cantilever beams from which outside walls are suspended.

Special glass is used to permit the penetration of beneficial ultraviolet rays of sunshine.

Science News Letter, May 23, 1931

CHEMISTRY

Mineral Oil Preserves Eggs on Large Scale

MINERAL oil seals and preserves between 1,500 and 2,250 dozen eggs an hour in a new electrically driven machine for processing eggs. The eggs remain good for more than a year.

After the eggs are properly candled, graded and cleaned they are put on an endless, moving belt in groups of three dozen and carried through a hot bath of mineral oil which hermetically seals the shells, the *Electric Journal* explains. It is said that no other chemical or physical change occurs and that weight, color and appearance remain the same.

Science News Letter, May 23, 1931

PSYCHOLOGY

Toy Highway Tests New Drivers Without Dangers of Road

WITH THE AID of a miniature car on a "toy" highway, Dr. A. R. Lauer, psychologist at Iowa State College, Ames, has developed a means for measuring driving ability without endangering the safety of other drivers on the road. Dr. Lauer is a member of the National Safety Council, and is conducting research for the committee on the psychology of the highway of the National Research Council.

The small car is operated by remote control with the standard driving equipment of the ordinary automobile, the person tested being seated in a regular driver's seat. The "road" is placed in front of the hood of the life-size car, and the driver must guide the small car over its whole length, around curves, past railroad crossings, and through other difficulties familiar to the motorist. Each time the car leaves the road or the driver fails to observe his instruc-

ARCHAEOLOGY

Explorer Finds First Traces of Unknown Everglades Tribe

Square Mile of Earthworks Near Lake Okechobee Are Largest Known Remains Left by Moundbuilders in America

FIRST TRACES of the unknown prehistoric Indians who lived in the Everglades have been discovered by Matthew W. Stirling, chief of the Bureau of American Ethnology. Mr. Stirling has returned from several months of archaeological exploration in Florida.

On the very edge of the Everglades, near Lake Okechobee, Mr. Stirling encountered a great plan of earthworks, elaborately laid out in embankments and mounds, and covering an area a mile square. So large and conspicuous are these earthworks, Mr. Stirling said, that it is surprising that no previous explorer has ever reported their existence or their significance. The nearest approach to anything like them are the famous Fort Ancient earthworks in Ohio, which were

also made by prehistoric moundbuilding Indian tribes.

The most prominent feature of the Everglades site is a flat-topped rectangle of earth built 30 feet high and 250 feet long. This was apparently the focusing point of attention for whatever ceremonies were held at the site. Earthen embankments enclose a court in front of this high place. Back of it a semi-circular bank of earth was raised.

This is only a small portion of the earthworks. A curious formation consisting of a large semi-circular bank extends in front of the high place and its court. And out from the semi-circle start a number of parallel lines of banks with circular mounds at the ends. Within the great semi-circle is a platform of earth six feet high and a quarter of a mile long.

"The whole plan is laid out with remarkable precision," Mr. Stirling reported. "The parallel lines are straight as a string, and the semi-circles are so perfect that we can imagine some Indian walking around a fixed point with a string held taut, to mark the outline."

Excavations into this important site will be made next season, Mr. Stirling said. In his exploration visit, he found potsherds on the edge of the site, showing that the inhabitants of the place were familiar with pottery. These Indians inhabited the Glades before the seminoles came there from farther north in comparatively late times.

Excavation of a large burial mound made of sand was another achievement of the expedition. This mound, south of Key Marco, contained 250 burials of Calusa Indians, together with their possessions. The Stone Age of prehistoric America was almost the Shell Age in this region, for the Indians had shell hoes and axes, shell cups and ornaments. Stone was scarce, though a few stone implements were brought in by traders from farther north.

It is Mr. Stirling's view that this mound was the burial place of the Indians who left the "biggest shell heap in the United States" famous in Florida.

Science News Letter, May 23, 1931

Science News Letter, May 23, 1931

PHYSICS

Experimenting With Millions of Volts

In Recent Laboratory Experiments Man Speeds Electrons Within One Per Cent of Einstein's Ultimate Velocity

By **WATSON DAVIS**

MILLIONS of volts, more electrical pressure than man ever produced before are being used by science in an attack on problems that lie at the very heart of physics and medicine. Millions of volts may explore the heart of the atom. They may bring a new treatment of cancer.

In at least four great laboratories, in Berlin, Pasadena, Schenectady and Washington, a friendly race is in progress to build larger vacuum tubes that operate at larger voltages and produce more intense radiations.

In the laboratories of the Carnegie Institution in Washington there work three physicists. They are at present out in front in this race for more intensive radiation. These three are Dr. M. A. Tuve, L. R. Hafstad and Odd Dahl, of the staff of the Department of Terrestrial Magnetism of the Institution.

Their tubes have operated at about 2,000,000 volts, they have generated sparks at 5,200,000 volts and they have a new method that promises much higher voltages.

Out of their tubes come the most penetrating radiation that man has ever made. It is more penetrating, more powerful, more capable of harm or good, than radium, wonder element. Judged by the possible usefulness of the radiations, the achievements of these experimenters in the forefront of physics are believed by many to be more important than would be the artificial manufacture of radium itself.

The new tube can duplicate the radiations from radium and deliver three kinds of synthetic radium radiations just when and where desired. Radium, the chemical element which, when isolated by the Curies just before the turn of the century, upset the idea of the permanency of matter, produces its radiation continuously and nothing that can be done to it changes its rate of disintegration and its shooting off of powerful rays.

The three kinds of radium radiations have been christened with the Greek letter names, alpha, beta and gamma.

Alpha rays are made up of hearts of helium atoms, positively charged, rushing along at high speed. Beta rays are electrons that are speeded up. These can be thought of as gobs of negative electricity, weightless, but the very essence of matter. Gamma rays given off by radium are not particles at all but true waves like radio, light or X-rays. They are nature's X-rays, with shorter wavelengths, higher frequencies and more penetration into solid matter than the ordinary X-rays used by physicians and scientists. The new super-X-ray tubes, in effect, create synthetic gamma rays.

Achievements of Others

Others have been in this high voltage race. Almost simultaneously with Dr. Tuve's measurement of the speed of his beta rays and penetrating power of his gamma rays, there came from Berlin the announcement of a similar feat by Drs. A. Brasche and F. Lange. These workers have also performed the feat of giving to electrons jolts amounting to more than two million volts.

And other workers have not been idle. Using apparatus like the usual X-ray tube, Dr. C. C. Lauritsen and his associates of the California Institute of Technology, Pasadena, have recently produced X-rays from electrons speeded by more than 600,000 volts. Dr. W. D. Coolidge of the General Electric Company, using a tube of his own design called a "cascade" tube, has produced 900,000 volt electrons. Though these latter rays are not so speedy as Dr. Tuve's, they have much greater total intensity. More elaborate protection is required for workers.

To speed up immensely a wandering electron it is simply allowed to fall. But instead of a gravitational pull, an electrical pull is required. It is to produce this pull that the immensely high voltages are needed. A falling electron is much like a falling brick. The farther it falls the faster becomes its speed. An electron that has fallen through two million volts requires vigorous stopping. It is speeding along at the rate of 184,000 miles per second. This is the first time such velocity, only one per cent. slower than the fastest

speed possible, the speed of light, has been achieved by man. Einstein holds as a central point of his relativity theory that nothing can surpass the speed of light.

Imagine a brick that has fallen from the top of the Empire State building. It will make quite a commotion if it hits anything and will be badly smashed. As an electron cannot be broken up it sets up a very violent vibration in the atoms of any target which has been placed in its path. These vibrations travelling out through the ether constitute the X-rays which have the power to penetrate ordinarily opaque matter.

The X-rays are thus not material particles but a wave motion similar to light waves. The ether vibrations produced in these new experiments are also similar to light waves but of shorter wave-length, of greater energy and greater penetrating power than ordinary X-rays. They can pass through three inches of lead, the most opaque substance for such radiations. These waves imitate, in all essential respects, the gamma radiation from radium.

Innovations in cancer treatment are one possible outcome of the new gamma rays, for it is this constituent of the radium radiations that is effective in



THE WINNERS

In the friendly race. Left to right, Dr. M. A. Tuve, Dr. L. R. Hafstad and Odd Dahl of the Carnegie Institution of Washington watching artificial radium rays emerge from their high voltage apparatus.

treating tumors. On the other hand the gamma rays can do incalculable harm. They produce serious burns in normal flesh exposed too long to their action. During the early days of pioneer work with radium and X-rays many workers lost their lives because the action of the rays is delayed and fatal doses had been given before the danger was realized.

Just how much risk Tuve, Hafstad and Dahl are taking in playing with such a dangerous radiation machine is still a matter of conjecture. Dr. Winifred Whitman of Johns Hopkins University has been collaborating with the trio of physicists on this aspect of the problem. As she happens to be Dr. Tuve's wife, she will probably see to it that he does not run unnecessary risks.

An explosion that will wreck this corner of the universe is another possibility contained in this pioneering research of the three Washington scientists.

They plan to produce the most powerful projectiles ever launched by human ingenuity. They plan to attack the heart of matter itself, the atomic nucleus. They will bombard it with very speedy hydrogen atom hearts, brothers in radiation to the alpha rays from radium. This may tap the internal energy of the atom.

Atomic Explosions

Startling consequences may be forthcoming if direct hits are scored upon the atomic nucleus in such a way as to change the atomic heart into a new kind of atom, provided certain scientific theories are correct. Immense amounts of energy might be liberated. This would attack other atoms and set up a chain of explosions, growing in violence until there would be a new star in this part of the heavens. The earth and all its inhabitants would be consumed by the heat created, and that would be the end of the world so far as human beings are concerned.

Most physicists today do not believe that there is much probability of world disaster following in the wake of the atomic researches now in progress. They see instead a new opportunity of discovering what is within the atom.

New apparatus of comparative simplicity now being perfected by the three X-rayteers promises to produce ten or more million volts capable of being applied to X-ray tubes. With such enormous electrical pressures, there can be created streams of atomic projectiles unrivaled here upon earth.

The vacuum tube used in the Carnegie Institution experiments is similar

in principle to the widely used X-ray tubes, which have been of such immense importance in medicine, in industry and in the physical laboratory. The design of the tube uses a principle due to Dr. W. D. Coolidge of the General Electric Company, who has made important contributions to the same problem.

Until recently the highest electrical pressure that had been impressed on an X-ray tube was about 250,000 volts, although the production of one million volts had been successfully accomplished.

The contribution of the Carnegie Institution physicists to the problem is twofold. They have devised ways of raising the greatest attainable voltage to dizzy heights and ingeniously solved the problems of applying these enormous pulls to a tube from which the air has been pumped. The apparatus which makes this possible occupies a building about 25 by 50 feet.

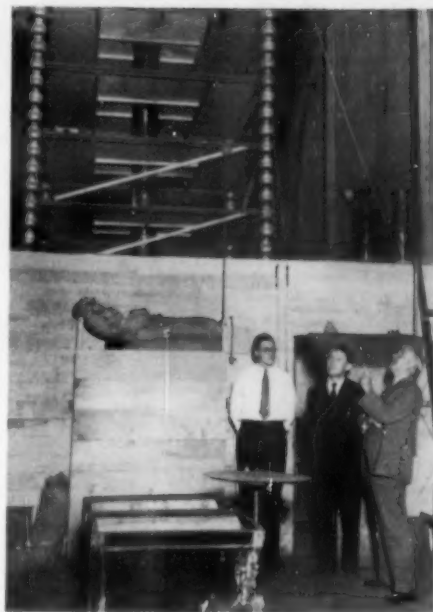
The attainment of voltage of from one to five million of short duration was completed as much as four years ago, in the early stages of this research. A modification of the so-called Tesla coil was used. This consists of a large coil of a few turns and a smaller one of many turns, both wound on the same axis. Like a step-up transformer or the more homely spark coil it converts an alternating voltage of low value into a much higher alternating voltage.

The primary coil of the Tesla set-up was supplied with the damped oscillatory discharge from a circuit containing a spark gap and a huge condenser consisting of glass plates about four feet square. The secondary coil of the Tesla, consisting of many turns of fine wire, is wound directly around the vacuum tube in which the electrons are driven up to their speed limit.

To aid in the insulation, both the coil and the tube are immersed in a large tank of oil about eight feet deep. At the highest voltages the coil and tank are subjected to a pressure of thirty-three atmospheres, which still further improves the insulation.

The electrons, instead of being given one big push, are given a series of smaller equal jerks as they progress down the tube toward the outside of the tank, where the experimenters are waiting for them with a magnetic device which measures their speed.

Previously Dr. C. C. Lauritsen of the California Institute of Technology had applied 750,000 volts to a gigantic X-ray tube by means of a transformer and standard X-ray technique. Dr. Coolidge



SANDBAGS AND CONCRETE

Protect scientists at the California Institute of Technology, Pasadena, from the high power X-rays of this 700,000 volt apparatus. Left to right, Dr. R. E. Vollrath, Dr. C. C. Lauritsen, designer, and Dr. Robert A. Millikan, Nobel prize physicist.

had successfully applied 900,000 volts to one form of his cascade tube about two years ago.

Dr. Lauritsen's tube is more nearly similar to the usual X-ray tube and not so revolutionary in design as the one in Washington. Much more power, however, is associated with the rays from the Pasadena apparatus, and therefore more protection is required for the scientists working with it, as may be judged from the concrete wall that surrounds the tube.

Dr. R. A. Millikan, under whose direction this work was carried out in California, has estimated that their tube would produce rays equal in intensity to those from twenty pounds of radium. That is about fifty times as much as all the purified radium available in the world. Twenty pounds of radium would be worth about five hundred million dollars.

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Science News Letter, May 23, 1931

Rainbows entirely red in color are sometimes seen when the sun is close to the horizon and when the air is dust-laden.

The rhinoceros though heavy is a remarkably agile beast.

PSYCHOLOGY

First Judgments Not Best on a Test

A HINT to the student who is likely to encounter one of the new "true-false" examinations is contained in a report made by Dr. Edna E. Lamson, of the University of Cincinnati, to the Midwestern Psychological Association.

Dr. Lamson asked a large group of students to leave their original answers on the examination paper whenever they changed their mind and decided that the correct answer was "true," not "false," or vice versa. She found that only two per cent. of the original answers were changed.

"It is better to record a second judgment than not to record it," said Dr. Lamson. "The chances are two to one that the second judgment will be the correct judgment. It is much safer to change a judgment from true to false than from false to true."

Science News Letter, May 23, 1931

PHYSIOLOGY

Man May Control Destiny By Glands and Environment

UNDERSIZED human beings will be able to add a cubit or two to their stature in the future by use of pituitary hormone, Dr. Oscar Riddle of the Carnegie Institution's Station for Experimental Evolution, Cold Spring Harbor, N. Y., predicted in a Science Service radio talk given over the network of the Columbia Broadcasting System.

Dr. Riddle sees the most promising method of controlling man's future development by manipulating his extremely complex environment rather than by modifying the minute bearers of heredity, the genes, within the egg cells in the hope of changing the character of all future generations.

Laboratory experiments cited by Dr. Riddle show that growing animals and plants can be profoundly modified by what happens to them. Take a little water out of certain eggs or shake them up and they proceed to develop without the intervention of a male parent. Fatherless frogs have been produced. Some worms can be made to grow a head where a tail would normally be found. Tadpoles can grow eye lenses from skin taken off their backs. Skin of a white Russian rabbit when refrigerated turns black and grows black hair. Sex of many animals can be controlled and re-

versed and oysters change their sex with the seasons. Well-fed mice can be made twice the size of ordinary mice.

Those stunted little human beings known as cretins are having inches added to their ultimate height by the use of the hormone prepared from the thyroid gland of the ox and sheep, Dr. Riddle said. Since the pituitary gland produces the growth hormone and can be used to double the size of salamanders, rats and bulldogs, Dr. Riddle predicted that it would soon be used to increase the stature of human beings.

But he was careful to explain that this hormone is not yet available for personal use and when it does finally arrive it will be administered by the medical profession.

Science News Letter, May 23, 1931

EDUCATION

College Sophomores May Get Uniform Examination

ABOUT A QUARTER of a million sophomores in colleges, teachers' colleges and junior colleges will be examined simultaneously on two days in May of 1932, if success meets plans of the Cooperative Test Service as outlined at the meeting in Washington of the American Council on Education by Dean J. B. Johnston of the University of Minnesota and Director Ben D. Wood of the Service.

Every college is invited to take part in this cooperative testing program, and other classes may take the same tests if the college desires it.

The same examination will be given throughout the whole country, so that any individual student may learn how he compares with all others, not alone in his own state but from Maine to California.

Included in the examination are tests of intelligence, general culture, general science, and English. Six and a half hours will be required for the examination which will be given in two periods.

The examination and others for use in future years will be constructed, tried out and standardized by the Cooperative Test Service. It will be of the objective type which may be scored with the use of a definite key of correct answers.

"That much useful data can be furnished by objective tests has already been demonstrated by the experience of many high schools and colleges. No claim is made that they are an adequate measure of all the outcomes of good instruction," Dean Johnston said.

Science News Letter, May 23, 1931

IN SCIENCE

STANDARDS

International Length Standard Falling Down

SCIENTIFIC length scales of hitherto superhuman accuracy are showing unexpected weakness in experiments conducted by the National Physical Laboratory located at Teddington, near London.

The superintendent of the Metrology Department of this laboratory is worried because four 24 meter "invar" surveying wires persist in showing a discrepancy in measurements of about 2 1/2 parts in a million.

These wires belong to the Bureau International des Poids et Mesures, in Paris, and were measured at Teddington in 1928, when a disagreement of two parts in a million was found between the values obtained at the two institutions. They have been sent over the Channel again for intercomparison with the Laboratory standards, and the results show that the disagreement found in 1928 still persists.

Invar is a metallic alloy which keeps its length unchanged with changes in temperature and is used for this reason in making watch parts.

Science News Letter, May 23, 1931

PALEONTOLOGY

Monster Dinosaur Skeleton Displayed in Washington

A GIANT dinosaur skeleton, seventy feet long from nose to tail tip and twelve feet high at its humped-up hips, has just been mounted in the U. S. National Museum.

The huge reptile, which belongs to the genus known as *Diplodocus*, has been seven years in preparation. A corps of scientists and technicians, working under the direction of Charles W. Gilmore, have spent over 2,500 working days, the equivalent of one man's time for nine years, carving the fossil bones out of their embedding matrix of stone, finding the right places for them in the skeleton and building the carefully fitted supporting framework of wrought iron.

Science News Letter, May 23, 1931

NCE FIELDS

ENTOMOLOGY

Gnats Kill 200 Mississippi Mules

BUFFALO gnats enough to kill a Dixie mule sounds like a large order; yet that is what two counties in Mississippi have been up against this spring, entomologists of the U. S. Department of Agriculture report. An outbreak of these troublesome insects, the worst in many years, was responsible for the death of at least 200 mules in the space of a couple of days. Other troublesome outbreaks of the same insects were reported from Arkansas and Kansas.

The buffalo gnat is an insect quite distinct from the somewhat annoying but really harmless little midges commonly known as gnats. It is a vicious little bloodsucker, with a distinguishing hump on its back that gives it its nickname.

Science News Letter, May 23, 1931

ARCHAEOLOGY

Ur of Chaldees Stood In Alexander's Time

DISCOVERY of important tablets and ruins which demonstrate that Ur of the Chaldees was a living city as late as 324 B. C. in the reign of Alexander the Great has just been reported by C. Leonard Woolley, field director of the joint archaeological expedition of the University of Pennsylvania Museum and the British Museum.

The newest discovery, which extends the history of Ur, is announced in the final report of the season's work at Ur, made to the University of Pennsylvania Museum, Philadelphia.

Mr. Woolley declares that there could be no more striking contrast than that between Ur of Abraham's time some 2,000 years before Christ and the last stage of Ur which was built fifteen centuries later.

"Abraham's Ur was a huddle of close-packed houses, small in area but solidly built with burnt and crude bricks, two and sometimes three stories high," Mr. Woolley states. "The houses were divided by narrow winding lanes

whose twists and turns were dictated by the accidents of private ownership.

"The Ur of Nebuchadnezzar was laid out on the gridiron plan with broad and straight main streets intersected at right angles by narrower cross-roads. The houses, built of crude brick with no burnt-brick foundations, were only one story high, but spread over so generous an area that a single house might constitute a whole block.

"One curious feature which Ur shared with contemporary Babylon gave to these wide streets a character probably unparalleled in any other age or land. The builders did all in their power to avoid a plain surface.

"Where a wall should normally have run in a straight line between two points, it is either broken up into a series of unnecessary buttresses, or, more often, resolved into a succession of short zigzags like the teeth of a saw."

Science News Letter, May 23, 1931

NUTRITION

Vitamins, Fattening Foods Needed by Tuberculous

VITAMINS A, B, and D and fattening foods are important constituents of the diet for tuberculous patients, Dr. Burgess Gordon and Dr. En Shui Tai of Philadelphia reported to the National Tuberculosis Association in Syracuse, N. Y., last week.

"It appears that a dietetic plan consisting of from 2,500 to 3,500 calories and supplemented with vitamins A and D provides a desirable food intake," they stated.

The Philadelphia scientists studied food eaten by a large group of tuberculous patients and other patients with lung disorders. They found that vitamin A probably helps to prevent the tuberculous patient from developing other infectious diseases and that vitamin B has some effect on the asthmatic symptoms. A combination of vitamins A and D apparently favors the increase of body weight.

"Excessive body weight is an important aid to the patient in tolerating active and extensive tuberculosis," Dr. Gordon said. "This is perhaps due to the adaptability of body fat and fluid to variations in temperature and humidity of the weather."

In high humidity, the majority of patients have increased loss of water through the skin and decreased secretion favors retention of poisonous products. This condition is considerably less disturbing in overnourished patients.

Science News Letter, May 23, 1931

EXPLORATION

U. S. Iceberg Expert To Fly to North Pole

THE UNITED STATES will be represented on the Graf Zeppelin by Lieutenant Commander Edward H. Smith of the U. S. Coast Guard when the airship sails during July on its flight over the Arctic to make contact at the North Pole with the submarine Nautilus under the command of Sir Hubert Wilkins. Harvard University, the American Geographical Society and the National Academy of Sciences recommended Commander Smith as a scientific member of the proposed Graf Polar trip of 1930 which did not materialize.

In the orders that relieve Commander Smith of active duty so that he can go on the trip this year the Coast Guard specifies that he is to gather scientific information which will be of value to the International Ice Patrol in the North Atlantic. The Ice Patrol is conducted by the Coast Guard and reports the location of bergs dangerous to shipping. Its expenses are met by a number of nations whose vessels use the North Atlantic.

Commander Smith has visited European countries inspecting oceanographic equipment and studied at the Geophysical Institute, Bergen, Norway.

Science News Letter, May 23, 1931

COMPARATIVE PSYCHOLOGY

Monkey Clever as Ape, Intelligence Test Shows

A CAPUCHIN monkey, rated zoologically as considerably inferior to the man-like tailless apes, has shown himself to be as clever as a chimpanzee at solving problems connected with food-getting.

The experiments of a Dutch scientist, Dr. Bierens de Haan, reported in the German scientific journal *Zeitschrift für vergleichende Physiologie*, consisted in confronting the monkey with the same task as that faced by chimpanzees in the earlier researches of the German scientist Dr. Wolfgang Koehler.

Food was suspended at the top of the cage, and several boxes, none of them high enough alone to enable the monkey to reach it, were left where he could handle them as he pleased. The monkey learned to pile the boxes one on top of the other and to climb up after the food, just as Koehler's chimpanzees had done.

Science News Letter, May 23, 1931

ENGINEERING

New S-Rotor Runs Efficiently On Both Wind and Water

Device Using Principle Applied to Rotor Ship is Finding Use Taking Small Amounts of Power From Nature

THE S-ROTOR, a new, simple and inexpensive type of windmill which, in addition to its chief duty as the world's most efficient harnesser of power from moving air, will ventilate buildings, generate power from the tides and draw smoke from stubborn chimneys, was described in Baltimore last week before the Aeronautic Division of the American Society of Mechanical Engineers by its inventor, S. J. Savonius, of Helsingfors, Finland.

Mr. Savonius began work on the S-rotor several years ago after his interest had been aroused by the success of Anton Flettner, the well-known inventor of the rotor ship. To make an S-rotor, so named after similarity be-

tween its cross-section and the letter S, a Flettner rotor was cut in half vertically and the halves separated along the cutting plane. Thus a vertical rotor that will turn equally well regardless of the direction of the wind is made.

Although rotors of this type are more efficient than ordinary windmills, they cost no more to make, it was stated. They are coming into wide use in Europe, where one of the manufacturers is Anton Flettner, who is recouping some of the fortune consumed in the exploitation of his rotor.

Replaces Ordinary Ventilators

As a ventilator, the Savonius rotor was said to be operating efficiently where ordinary cowls have failed. It develops uncommonly strong suction power. In the water the rotor operates the same way it does in the air, but since water is about 800 times as heavy as air the power generated is greater in proportion. One of its advantages as a tidal motor is that it always turns in the same direction regardless of whether the water is ebbing or flooding.

MEDICINE

Seasickness Affects Women More Often Than Men

SEASICKNESS is not at all an impartial affliction. It discriminates among its victims by sex, by age, by race. Women suffer oftener than men, and little girls of ten or twelve years more than anybody else. Babies and very young children, fortunately, are troubled relatively little.

These are among the observations of Dr. A. Seitz, for many years a ship's doctor, as published in the German journal, *Natur und Museum*.

Among white men, the Germanic peoples are more resistant to seasickness than are the Latins, Dr. Seitz says.

Mr. Savonius did not make exaggerated claims for his invention. He said that it is not suitable for power plants of such magnitude as those contemplated by Georges Claude in his recent experiments in Cuba, but that it is adapted to small and inexpensive plants working in a river or tidal creek and that as such it could extract a considerable amount of power for use in irrigation and for supplying light and power to farms and villages.

Science News Letter, May 23, 1931

ARCHITECTURE

British House Planned To Shut Out Traffic Din

ON THE PRINCIPLE that prevention is better than cure, an English architect is exhibiting in London a house that is built first and foremost to answer the prayer "Oh, for a quiet life!"

All the rooms are placed at the back. Its front and side walls are windowless. The front wall forms a screen against noise, and is broken only by a decorative front door and the doors of a yard and garage.

Not merely does the design shut out noise from outside, but there are rooms inside where sounds can be bottled up. Eel-grass from Nova Scotia, tough kraft paper, special wall-board, are among the sound and heat insulators that have been used in providing rooms where children need not be on their best behavior if Dad is at work, for not a sound can penetrate to him.

Science News Letter, May 23, 1931



WINDMILL SUBSTITUTE

The odd-looking s-rotor which may replace windmills as a source of power from moving air.

Negroes are exceedingly sensitive, and are very likely to roll moaning on the deck. This is the more peculiar, in Dr. Seitz's opinion, because of the usual passivity that marks Negroes as a race.

Hindus, who are also a passive people, meet seasickness with an entirely different front. They even seem to take a certain satisfaction in their suffering, which Dr. Seitz believes is due in part to the traditional Hindu life philosophy. Chinese, with a different philosophy, are as susceptible as Hindus, but simply bear their affliction with stony-faced stoicism.

Science News Letter, May 23, 1931

GEOLOGY

How Scotland's Mountains Arose

"A Classic Of Science"

Archibald Geikie, Famous Scotch Geologist, Tells of the Shaping of His Rugged, Beautiful Country

THE SCENERY OF SCOTLAND viewed in Connexion with its Physical Geology. By Archibald Geikie. London and Cambridge, Macmillan, 1865.

WHEN WE begin to inquire into the origin of the present scenery of the country, we are soon taught that each hill and valley, each mountain and glen, has a twofold history. There is first the story of the formation of its component rocks, whether these have been laid down layer after layer as sand, gravel, or mud upon the bottom of a former sea, or piled up as shingle along an ancient beach, or drifted as the finest ooze over the bed of a lake; whether formed of decay of extinct forests, or from the gathered fragments of corals and shells; whether rolled along in the form of liquid lava, or thrown up in showers of volcanic dust and ashes. And after we have tried to trace out the succession of events imperfectly chronicled in the rocks, and have learnt, in so doing, how little we know, and how utterly beyond human realization is the vastness of the antiquity thus recorded, there still remains the story of those after changes, whereby the various rocks that were piled over each other came to be upheaved and carved into the present framework of the country. Between the time when the rocks were formed and that in which they were raised into the land on which our hills and valleys have been moulded, long millions of years must in many cases have passed away, during which metamorphism and other underground processes were at work; for when these rocks appeared in the light of day they were often vastly different from the original condition. Sand, silt, and mud had been changed into schist, slate, gneiss, and granite; and this not in mere local patches, but, as in the Highlands, over an area many thousands of square miles in extent.

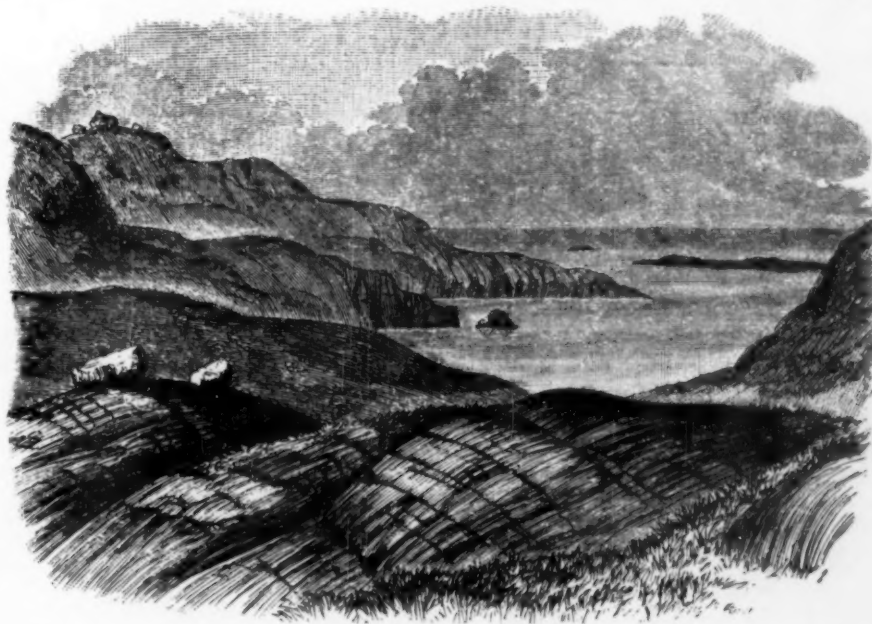
The hills and valleys of Scotland, we have seen, are not all of one age. They differ greatly also in geological struc-

ture, with a corresponding variety of scenery. As a convenient subdivision they were grouped into three districts—the Highlands, the Southern Uplands, and the Midland Valley. In taking leave of them, however, for the present, let us regard them finally as a whole, and picture briefly the changes by which their rocks, whether formed in lake, river, or sea, have come at last to wear their present outlines on the surface of the land. We watch them raised by subterranean movement within reach of the waves, and there for long ages.

Sea-Worn Platforms

"Swilled with the wild and wasteful ocean," until hundreds and thousands of feet of solid rock had been worn away. During possibly many risings and sinkings of the land this marine denudation went on, and by degrees the waves succeeded in levelling the country into broad undulating table-lands. It was out of such sea-worn platforms that the Scottish mountains and valleys appear to have been carved.

We mark how simply the present grouping of the valleys may have arisen. Rain falling on the land that was rising above the sea-level, found its way from the centre by devious paths outwards and downwards to the shore. These paths, once chosen, would ever be deepened and widened as century after century rolled away. The wide table-lands, like a sandy beach on the recession of the tide, were thus slowly hollowed out on every side by little runnels, that gathered into brooks, thence into larger streams, and lastly into broad rivers that swept the drainage out to sea. Year by year the process of excavation went on, every shower of rain, every spring, every frost, every stream contributing its share in the general waste. In the contemplation of such a history we are in a manner baffled and overawed by the vastness of the time which is required; the work accomplished is so vast, and the workers, even if we suppose that they once worked more rapidly and vigorously than they do now, seem so feeble. We may in imagination watch that ancient land for a thousand years, and yet detect no appreciable change upon its surface. We return to it after the lapse of a thousand centuries, and find per-



GLACIERS INVADIED SCOTLAND LEAVING LANDSCAPES LIKE THIS
From Geikie's famous *Textbook of Geology*, first edition, 1882; "Ice-worn surface of rock, showing polish, striae and groovings."

haps that the valleys are only a little deeper, and that the broad undulations between them begin to bear but a far-off resemblance to hills. At the end of another long interval, during which perchance the land has undergone not a few unequal upheavals and depressions, the hollows have sunk a little more. But how impossible to realize, even if we may yet be able to estimate, the time which was needed to change the ancient table-lands into a region of mountains and valleys; to excavate the wide straths and glens; to scarp the cliffs and precipices; to roughen the mountainsides with crag and scar and rocky pass; to dig the ravines and twilight gorges; and to carve out all that varied scenery which we know so well!

Perhaps it may yet be ascertained, that among the agents which in successive geological periods helped in no small degree to alter the surface of the globe were sheets of land ice and fleets of floes and bergs. There are indications of old glacial periods in Paleozoic, Secondary, and Tertiary times, and we may eventually learn that the glaciers and bergs of some of these remote ages took a part in carving out the valleys and planing down the table-lands of this country. But, be that as it may,

we know that the last great glacial period wrought marvellous changes upon the surface of the British Islands. In now glancing once more at the history of these changes, let us imagine the land, at the beginning of that period, rising into the same wide sweep of hill and valley as it does today. Gradually its plants and animals are displaced by those of more northern latitudes, as the temperature becomes year by year more wintry and ungenial. The snow creeps down from the hills, the forests and their inhabitants are pushed nearer and yet nearer to the sea; until at last, save perhaps in a narrow stripe along the shore in summer, one wide mantle of snow and ice has enveloped the land from the mountain peaks to the sea.

The Ocean Freezes

Still the cold increases. The very ocean freezes into solid sheets around the shores. The high grounds of the interior—higher, perchance, by several thousand feet, than they are today—receive a constant accession of snow, and the accumulated mass, pressing down the valleys, goes out to sea in long wide walls of ice. As it descends, year after year, and century after century, the surface over which it moves is ground and polished, the hardest rocks are shorn down, the ruggedness of the ancient land is largely worn off, countless lake-basins are excavated in the rocks, and an undulating outline is impressed upon the whole length and breadth of the country. The moraine-rubbish of this great ice-sheet gathers into the thick deposit known as *boulder-clay*. The summer, brief and feeble, has yet strength enough to melt the last winter's snow along the coast and in the maritime valleys; and doubtless, under the fading skirts of winter, the bright flowers of an Arctic type—saxifrages, ranunculi, willows, mosses, and the rest—spring rapidly into bloom. Nor are the larger mammals wanting; in such sheltered nooks the mammoth and the rhinoceros would find their appropriate food, as their survivors, the reindeer and the musk-ox, still do in the far north. The storms of summer work dire havoc on these shores for the groundswell, setting in strongly on the land, breaks up the coast-ice into heaps of ruin, which, laden with rocks and mud, are borne off, until they melt in mid-ocean or are stranded on other coasts.

The next act in this strange drama brings before us this ice-covered land slowly sinking beneath the sea. The higher mountain-tops, however, remain

"And he will stretch out his hand against the north and destroy Assyria; and will make Ninevah a desolation, and dry like a wilderness."
—Zephaniah. 2, 13.

LAYARD'S

Excavations at the Site of Ninevah

will be the

NEXT CLASSIC OF SCIENCE

above water, and send out their fleets of bergs and ice-rafts, for the climate is still severe enough to nourish on the narrowed land an abundant growth of ice and snow. Many a huge mass of granite or gneiss or schist is thus dropt quietly over the coal-measures of the Lothians; many a block of grit and greywackè is borne from the lonely islets of Lammermuir, Moorfoot, Dumfries, and Galloway, and sunk upon the hills and valleys of the north of England. Nay, large boulders of mountain-limestone are lifted from the coast-line skirting the half-submerged hills of Northumberland and Yorkshire, and scattered far and wide over the central counties. Even from the distant shores of Scandinavia bergs bring fragments of gneiss and granite to the plains of Central and Southern England. To this and the later parts of the history the upper boulder-clay and sandy drift are probably to be assigned. Moreover, the grating of these ice-islands over the sunken hills must doubtless have given rise to much abrasion of the solid rocks. Many a Scottish hill-top may thus have been smoothed and striated anew; and we probably see proof of the same process in the large number of scratched fragments of chalk from the Yorkshire Wolds in the boulder-clays of the east of England. The land once more begins to rise; the glaciers in the mountains of Wales, Cumberland, the south of Scotland, and the Highlands resume not a little of their former massiveness, as the country gathers increase of size.

Hills Clothed With Green

The sand and clay which the sea may have left behind it are by the ice cleared out of the glens. With the widening area of land, and the lessening severity of the climate, the hills and valleys, where free from perennial snow, are clothed with vegetation and haunted by



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beasts of the chase. By a succession of changes, as slow and silent, doubtless, as those which ushered in the Age of Ice, that long era begins to draw to a close. The glaciers feel the breath of a warmer clime coming over them, and shrink step by step back into the mountains, leaving, at every pause in their decline, great heaps of earth and rock—memorials, as it were, of their final and fruitless conflict with the adverse elements. But their doom has come, and the last lingering remnant of the old ice-sheet vanishes away. The very plants and animals of that cold period are involved in the same fate. Slowly and reluctantly they are driven from the lower grounds, as species after species makes its appearance from other lands, like the successive hordes of a conquering people. And now at last, on the bleakest and barest of our uplands, from which there is no escape, they carry on the struggle still. But the skirmishers of the invading army are amongst them, and the time will doubtless come when the ancient and Alpine races will disappear from our highest mountain-top, and with them the last living terrestrial relic of the great glacial period.

Since the ice melted away, the sea, rains, streams, springs and frosts have renewed their old work of demolition. The smoothed and flowing outline which the ice left behind it is now undergoing a slow destruction, and the rocks are quietly resuming the rugged outlines which they had of old. The sea-coasts are receding before the onward march of the waves; former ravines are deepened and widened by the rivers, and new ones have been formed. Man too has come upon the scene, and has set his mark upon well nigh every rood of the land from mountain-top to sea-shore. He has helped to demolish the ancient forests; he has drained innumerable fens and mosses, and turned them into fertile fields; he has extirpated the wild beasts of the old woods, thus changing both the aspect of the country and the distribution of its plants and animals. He has engraved the country with thousands of roads and railways, strewn it with villages and hamlets, and dotted it with cities and towns. And thus more has been done by him, in altering the aspect of the island, than has been achieved during the brief period of his sojourn by all the geological agencies put together.

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ZOOLOGY

Animals of Old West Will Get Chance to Stage Comeback

ANIMALS of the old West, the West of the covered wagon, will be given their chance to stage a comeback in territory that was theirs but where no living man has ever seen them. The three hundred mile strip of Mississippi bottom lands, set aside by Congress as a great game refuge, is to be stocked with bison, pronghorn antelope, elk and other hoofed and horned creatures that the redskins and earliest French traders knew a couple of centuries ago.

This promise was held out by Vernon Bailey, of the U. S. Biological Survey, at the meeting of the American Society of Mammalogists in Philadelphia last week. Mr. Bailey spent all of last summer in the region, studying its

present life and its possibilities for supporting representatives of its original population of wild things.

But last summer was by no means the first time he saw the area. He went there first in 1869, and on that occasion he travelled in a covered wagon.

Due For Radical Change

The region as it now stands consists of a strip of rich bottom land on either side of the Mississippi, subject to frequent floods, alternated with droughts. It is due for a radical change, said W. C. Henderson, also of the Biological Survey, if the present plans of the War Department are carried out. These plans call for the establishment of a nine-foot channel instead of the present six-foot one. This will mean the building of a series of about twenty dams, converting the river into a long line of stepped-up lakes, doing away with most of the current, establishing a stable water level and flooding some of the land permanently. On the whole, it will be a good thing for the wild life of both land and water, he believes.

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REFRIGERATION

One Chunk of Ice Lasts All Summer

REMINISCENT of the man who met the doctor's orders of "only one cigar a day" by buying stogies two feet long, is a new type of refrigerator recently built at Iowa State College, Ames, Iowa, by L. V. Crum of the physics department, which uses only one chunk of ice in a whole summer. The joker is, that this one chunk of ice is six feet high and six feet in diameter.

The new ice-box is a triumph of economy. Its first cost for materials is only \$50 to \$65, and its upkeep is nothing. It consists of two tanks, one six feet in diameter inside another one eight feet in diameter and nine feet high. Sawdust or similar material is used as insulation between the walls of the tanks. A cooling compartment is built under the center tank.

Ice is frozen in the winter in the inner tank, which is then covered with about sixteen inches of insulation also. The solid chunk of ice, six feet high and six feet in diameter, lasts from spring until September. In a test during the past year meat was kept during the summer for two weeks and apples were kept from spring to late summer in good condition.

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HEART OF ALL-YEAR ICE BOX

Frozen by spraying water on chicken wire. When completed it will be six feet in diameter.

PSYCHOLOGY

Most Women Like Their Work But Some Jobs Disdained by All

MOST WORKING women actively like their present occupations, a questionnaire answered by 13,752 mature, experienced women engaged in the higher occupational levels throughout the country indicates.

The survey, which was conducted by the Bureau of Business Research of the University of Michigan with the cooperation of the National Federation of Business and Professional Women's Clubs, also indicates that women engaged in different fields of work vary in their characteristic occupational interests and only a very few occupations are consistently liked or disliked by women in all types of work.

Business for self, home-maker, secretary and social worker were the only jobs which the various working groups unanimously regarded with favor. The jobs of barber, book agent, chiropodist, elevator operator and laundress were, on the other hand, looked upon with dislike by all the working groups questioned.

A longer list of occupations, including the career of wife, office manager and musician, were thought of with either favor or indifference combined with favor. While the majority of the nearly 14,000 women represented in the questionnaire were single and half of them were more than 37 years of age, their answers indicated that the working

woman is interested in home-making and marriage but do not show whether she would be willing to sacrifice her business career for home or vice versa.

But the romance popularly supposed to surround movie stardom in the mind of the working girl or woman apparently is a fiction. For the job of movie star along with that of waitress, dentist and landlady belonged in a group of occupations regarded by all groups with disfavor or disfavor combined with indifference.

The ten occupational groups stating their work preferences in the questionnaire were private secretaries, office managers, bookkeepers, stenographers, office clerks, high school teachers, grade school teachers, trained nurses, sales proprietors and retail saleswomen. The survey was directed by Prof. Grace E. Manson.

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MEDICINE

Drugs Relieve Pains of Lead and Gallstone Colic

THE INTENSE pain of lead colic, gallstone colic and ureteral colic can be relieved by slow injection into the veins of calcium chloride, a salt of the metal which is necessary for bone formation, Drs. Walter Bauer, William

T. Salter and Joseph C. Aub of the Massachusetts General Hospital in Boston have just found. This gives more rapid relief than any other form of treatment tried by these physicians.

Their discovery of this new use of a calcium salt and of a way to give relief in these distressing conditions was made in the course of studies on the treatment of lead poisoning, they stated in their report to the American Medical Association.

Lead and calcium, they knew, were both retained in the body in the bones. The chemical behavior of certain lead and calcium salts in the body is very similar. These facts suggested to Dr. Aub that the same physiologic variations which influenced the elimination and excretion of calcium would similarly influence the lead stream.

Medicines that caused decalcification or removal of calcium from the body resulted in an increased excretion of lead, it was found. Conversely, treatment that increased calcium storage also increased storage of lead. Consequently in treating lead poisoning, a high calcium diet is used until all symptoms of the poisoning have disappeared, usually within one or two days. The theory underlying this is that following increased calcium retention as a result of the high calcium diet, the lead is removed from the blood and stored in the bones.

In order to hasten this process and give more prompt relief from the severe pain of lead colic, Dr. Aub and associates tried giving a solution of calcium chloride directly into the veins.

The results were dramatic, they reported. The pain stopped almost immediately, often before the injection was completed. Such prompt relief made them doubt whether the beneficial action of the calcium salt was due to fixation of lead and calcium salt in the bones. Further studies indicated that the calcium salt acts as an antispasmodic. The mechanism of its action, however, remains unexplained at present.

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Physicians and surgeons from all over the United States will gather at Philadelphia next month for what is probably the largest medical meeting of the year, when the American Medical Association convenes for its eighty-second annual session. The association was founded in Philadelphia 84 years ago but this is the first time it has met there since then. About 8,000 physicians are expected for the meetings from June 8 to 12.

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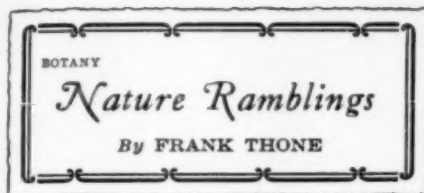
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Wild Iris

OUR GRANDMOTHERS always kept a goodly plot, in their well-tended gardens, for the flowers they called "flags." We, with a wider world of horticultural offerings to choose from, are becoming increasingly devoted to the taller, more variegated, frequently more delicately tinted descendants of these same flags, which we now call by their Latin name, *Iris*.

But almost all of the varieties of iris we grow in our gardens, as well as the old-fashioned "flags" of our grandmothers, are imported flowers—immigrants or the descendants of immigrants, like ourselves. Some of them, like the bright yellow *Iris pseudacorus*, have escaped from cultivation and are mingling amicably with the native wildflower population in wet places.

However, America has its own tribe of native irises, that need yield nothing to the newcomers from Europe and the Orient, whether in beauty of form or in decorative color scheme. Perhaps the most widely distributed, and certainly one of the loveliest, is the species known simply as the larger blue flag.

There is a peculiar thing about all iris leaves, that is not found in those of any other flower. If you will look at one of the plants, you will see that the stiff, sword-shaped leaves are turned edgewise toward the stem, and not, as in other plants, with the flat side facing upward. You will notice also that the stem seems to come from the inside of the leaf, which clasps its base. The reason is, that the iris leaf is really folded in the middle, with its upper surface grown together inside, so that what seem to be the two sides of the leaf are really only two halves of the back!

Science News Letter, May 23, 1931

ASTRONOMY

Search for Comet In Eastern Morning Sky

AFTER nearly eight months without discovering a comet, astronomers are now anxiously watching the eastern morning sky for the reappearance of Neujmin's periodic comet. Discovered by a European astronomer in 1913, it was under observation at that time from September 6 to the following January. Since then it has not been seen, but calculations indicate that it returns once every 18 years.

Dr. Harlow Shapley, director of the Harvard College Observatory, Cambridge, Mass., has made public a "search ephemeris" computed by Frank Scagrove. This tells where the comet should be, and provides astronomers with information as to where they should direct their telescopes. According to these figures the comet is now in the constellation of Cetus, the whale, visible low in the east just before sunrise. It is moving in an easterly direction, towards the sun, so that it will increase in brightness, but as it enters the sun's glare, it will become more difficult to locate.

Probably even when brightest, it will be too faint to be observed with the unaided eye.

Science News Letter, May 23, 1931

COMPARATIVE PHYSIOLOGY

Touch of Spring Fever Makes Whole World Kin

See Front Cover

IN THE SPRING a young man's fancy turns to thoughts of another nap even more often than it does to amative imaginings, Tennyson to the contrary notwithstanding. "Spring fever," that drowsiness and mild lassitude that comes of warmth and well-being rather than of the crabbed winter of fatigue, has never received the serious attention of research workers in pathology—and it is to be hoped it never will. They might turn up a cure for it, which would be most deplorable.

Whatever spring fever is, it is no monopoly of the higher primates. Its benign affliction is visited on our humbler brethren as well. Cornelia Clarke's cat had a fine attack of it. Miss Clarke herself, however, remained awake enough to snap the camera shutter at the right moment.

Science News Letter, May 23, 1931

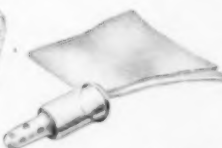
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• First Glances at New Books

Physics

THIS MECHANICAL WORLD—Morton Mott-Smith—*Appleton*, 233 p., \$2. This is the latest of the "New World of Science" series edited by Watson Davis, managing editor of Science Service. The series addresses itself to the intelligent general reader without training, who wishes to get a vivid view of a broad field of science. Dr. Mott-Smith has shown clearly in this book that it is not necessary to go into the more abstruse incantations of the new physics in order to produce an intellectually stimulating book. It is also clear that the essential nature of physical thinking can be disclosed to the layman without the aid of repellent, arid, mathematical abstractions—a fact that was shown by Mach and Tyndall but has been somewhat forgotten by the present generation of physicists. This is the book that college teachers of physics to non-scientific students have been looking for.

Science News Letter, May 23, 1931

Ornithology

THE BIRDS OF HAITI AND THE DOMINICAN REPUBLIC—Alexander Wetmore and Bradshaw H. Swales—*Government Printing Office*, 26 p., \$1. The avifauna of the first large island that Columbus found has remained among the least known of all American groups, though it contains many very interesting forms. The authors, therefore, have made ornithologists, and naturalists generally, their debtors by the production of this well-rounded monograph. A number of the plates illustrating characteristic species are by Allan Brooks.

Science News Letter, May 23, 1931

Medicine

TALKS ON TUBERCULOSIS WITH PATIENTS AND THEIR FRIENDS—John B. Hawes 2nd—*Houghton Mifflin*, 179 p., \$2. A practical, helpful book covering the subject completely for the patient from the nature of the disease and early symptoms to advice on occupations for the ex-consumptive and a library for the tuberculous.

Science News Letter, May 23, 1931

Biography

COPE: MASTER NATURALIST—Henry Fairfield Osborn—*Princeton University Press*, 740 p., \$5. One of the great figures that dominated American natural science during its period of early matur-

ity in the latter half of the nineteenth century here finds a worthy biographer in the Nestor of present-day American paleontology.

Science News Letter, May 23, 1931

History

ANCIENT JERUSALEM—James Baikie—*Black, London*, 90 p., 2s 6d. A little history of Jerusalem down to the time of Christ. The story is vividly told by an archaeologist who specialized in the civilizations of the East. One of the series entitled "Peeps at Ancient Civilizations."

Science News Letter, May 23, 1931

Medicine

CANCER AND SCIENTIFIC RESEARCH—Barbara Holmes—*Macmillan*, 160 p., \$1.50. Preface by Sir F. Gowland Hopkins, President of the Royal Society. This splendid small volume gives the lay reader an idea of the scientific and statistical work being done in the laboratory on cancer. The emphasis is on the search for the causes of cancer rather than on efforts to cure the disease. Explanation of the technical terms is given in detail in the appendix which is considerably more than a glossary. There is also an index. This is one of the Sheldon Books of Popular Science.

Science News Letter, May 23, 1931

Sociology

RURAL GIRLS IN THE CITY FOR WORK—O. Latham Hatcher—*Garrett and Massie*, 154 p., \$1.75, postage extra, \$1.90 postpaid if check sent with order. The book is an account of a study made for the Southern Women's Educational Alliance. It should be of great interest to social workers, educators, leaders of recreational agencies, and vocational trainers. It is nontechnical, all statistical material being grouped in a final chapter. The study was limited to Virginia and North Carolina, but that does not lessen its value or interest.

Science News Letter, May 23, 1931

Radio

RADIO HANDBOOK—James A. Moyer and John F. Wostrel—*McGraw-Hill*, 886 p., \$5. A comprehensive volume containing in small compass much fundamental information about radio and other related fields such as photoelectricity, television and sound motion pictures.

Science News Letter, May 23, 1931

Anthropology

RATIONAL EVOLUTION—Robert Briffault—*Macmillan*, 302 p., \$3.50. "Man is anxious not to know the truth. He uses his intelligence, as no other animal is permitted to use its means of guidance, to suppress what he accounts unpleasant facts, and to establish belief in what harmonises not with his experience, but with his wishes." The broad outlines of history have been rewritten in the light of this point of view by the author of the encyclopaedic three-volume book, "The Mothers." At another place he says: "The traditional heritage is not only a precious storehouse of accumulated experience and power; it is also a cesspool of superstition." It is Dr. Briffault's thesis that the decay of the historic civilizations was not inevitable and the causes are traceable to the falsification of thought processes.

Science News Letter, May 23, 1931

Medicine

FOOD POISONING AND FOOD-BORNE INFECTION—Edwin O. Jordan—*University of Chicago Press*, 286 p., \$2.50. Latest information on this important subject has been gathered for this rewriting of the book. Not too technical for the intelligent reader who wants to know about botulism, poisonous plants, tapeworms and similar subjects included in the scope of this book. The illustrations are very helpful.

Science News Letter, May 23, 1931

General Science

EXPLORATIONS AND FIELD WORK OF THE SMITHSONIAN INSTITUTION IN 1930—*Smithsonian Inst.* 224 p. In this annual publication, Smithsonian representatives "get together" in print to tell briefly what the adventures of the year have been. The expeditions of 1930 include a quest for the ancient relatives of living whales, a biological collecting trip on Tin-Can Island, excavation of mounds of the vanished Calusa Indians of Florida, and 27 more adventures in the United States and abroad.

Science News Letter, May 23, 1931

Biology

ESSENTIALS OF BIOLOGY—W. H. D. Meier and Lois Meier—*Ginn*, 529 p., \$1.68. A general biology textbook for use in normal and secondary schools, clearly written and well illustrated.

Science News Letter, May 23, 1931